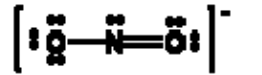

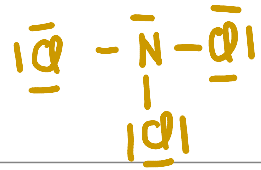


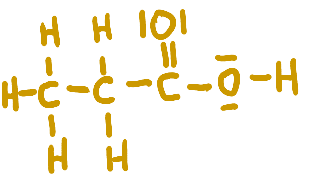


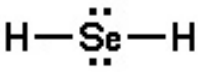

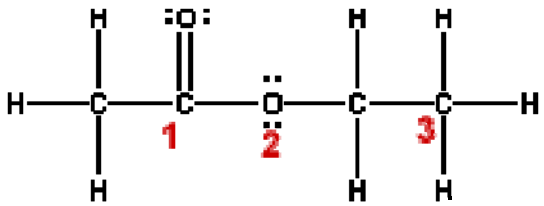
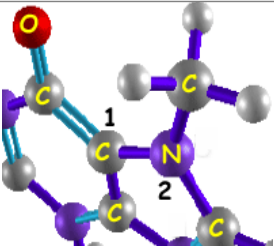


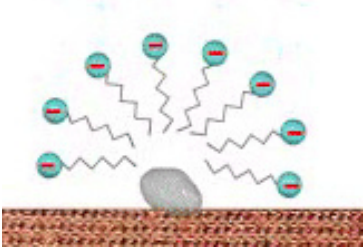
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Last KeyFirst Answer

Question 1 6 Points		The following questions pertain to the Lewis Dot structure depicted on the left a) With respect to the central nitrogen atom : i. The number of lone pairs : <u>1</u> ii. The number of single bonds : <u>1</u> iii. The number of double bonds : <u>1</u> b) How many equivalent Lewis Structures does the nitrite ion have? <u>2</u>
Question 2 12 Points	Draw a Lewis structure for each of the following where the central atom obeys the octet rule .	
	N ₂ 	NCl ₃ (Cl = Chlorine) 
	NOF 	Cyanide ion 
Question 3 12 Points	Draw a Lewis structure for each of the following organic molecules on the left. Then use your diagram to answer the questions on the right.	
(6 Points)	CH ₃ CH ₂ COOH 	<u>Count double bonds as 2 bonds for this structure only.</u> a) The number of C-H bonds <u>5</u> b) The number of C-C bonds <u>2</u> c) The number of C-O bonds <u>3</u>
(6 Points)	C ₂ H ₄ 	a) The number of C-H bonds <u>4</u> b) The number of C-C single bonds <u>0</u> c) The number of C=C double bonds <u>1</u>
Question 4 6 Points	a) Name of the compound with the formula N ₂ O? <u>Dinitrogen monoxide</u> b) Name of the compound with the formula SO ₂ ? <u>Sulfur dioxide</u> c) Formula for dinitrogen tetroxide? <u>N₂O₄</u>	

<p>Question 5 4 Points</p>	<p>Draw all resonance structures for HCO_2^-:</p> 	
<p>Question 6 6 Points</p>		<p>The following questions pertain to the Lewis Structure of SeH_2 depicted on the left:</p> <p>a) The electron-pair geometry around Se is: <u>TETRAHEDRON</u></p> <p>b) The molecular geometry around Se is: <u>ANGULAR/BENT (109°)</u></p>
<p>Question 7 6 Points</p>	<p>a) What is the electron-pair geometry about N in NICl_2: <u>TETRAHEDRON</u></p> <p>b) What is the molecular geometry about N in NICl_2: <u>TRIGONAL PYRAMID</u></p>	
<p>Question 8 6 Points</p>		<p>What is the molecular geometry about:</p> <p>a) Atom 1: <u>TETRAHEDRON</u></p> <p>b) Atom 2: <u>TRIGONAL PLANAR</u></p> <p>c) Atom 3: <u>ANGULAR/BENT (109°)</u></p>
<p>Question 9 6 Points</p>		<p>The predicted bond angle about:</p> <p>a) Atom 1: <u>120°</u></p> <p>b) Atom 2: <u>$\sim 109^\circ$</u></p> <p>c) Atom 3: <u>$\sim 109^\circ$</u></p>
<p>Question 10 4 Points</p>		<p>What is the predicted bond angle about the following atoms?</p> <p>a) Carbon 1: <u>120°</u></p> <p>b) Nitrogen 2: <u>$\sim 109^\circ$</u></p>
<p>Question 11 6 Points</p>	<p>Label the following molecules as polar or nonpolar. (The central atom is given first in the formula)</p> <p>a) NOCl (Cl = Chlorine) <u>POLAR</u></p> <p>b) N₂ <u>NONPOLAR</u></p> <p>c) SCl₂ (Cl = Chlorine) <u>POLAR</u></p>	

<p>Question 12 3 Points</p>	<p>In our discussion on the consequences of molecular polarity, the cartoon shown below was used to discuss:</p>  <p>a) Membranes b) Micelle action c) Fabric softeners d) Like dissolves like e) Detergents</p>
<p>Question 13 4 Points</p>	<p>Write the equilibrium constant expression, K, for the following reactions:</p> <p>a) $F^- + H_2O(l) \rightleftharpoons HF(aq) + OH^-$ $K = \frac{[HF][OH^-]}{[F^-]}$</p> <p>b) $2NOCl(g) \rightleftharpoons 2NO(g) + Cl_2(g)$ $K = \frac{[NO]^2[Cl_2]}{[NOCl]^2}$</p>
<p>Question 14 4 Points</p>	<p>For the following equilibrium system, $K = 4.50 \times 10^{10}$ at 298K.</p> $HNO_2(aq) + OH^- \rightleftharpoons NO_2^- + H_2O(l)$ <p>Assuming that you start with equal concentrations of HNO_2 and OH^-, and that no NO_2^- is initially present, which of the following best describes the equilibrium system?</p> <p>a) The reverse reaction is favored at equilibrium. b) Very little HNO_2 will be present at equilibrium c) Appreciable quantities of all species are present at equilibrium. d) The forward reaction is favored at equilibrium.</p>
<p>Question 15 4 Points</p>	<p>Consider the following system at equilibrium at 723 K</p> $2NH_3(g) \rightleftharpoons N_2(g) + 3H_2(g)$ <p>When some $NH_3(g)$ is removed from the equilibrium system at 723K The reaction must:</p> <p>a) Run in the forward direction b) Run in the reverse direction c) Remain the same</p> <p>The concentration of H_2 will</p> <p>a) Increase b) Decrease c) Remain the same</p>
<p>Question 16 4 Points</p>	<p>Consider the following system at equilibrium at 298 K:</p> $2NO(g) \rightleftharpoons N_2(g) + O_2(g) + 43.2 \text{ kcal}$ <p>If the temperature on the equilibrium system is suddenly increased: The reaction must:</p> <p>a) Run in the forward direction b) Run in the reverse direction c) Remain the same</p> <p>This is because by increasing the temperature, K:</p> <p>a) Increases b) Decreases c) Remain the same</p>

Question 17
3 Points

Consider the following system at equilibrium at 298K:

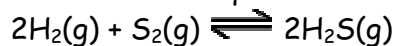


The addition of H_3O^+ will cause the concentration of HNO_2 to:

- a) Increase
- b) Decrease
- c) Remain the same

Question 18
4 Points

Consider the following **exothermic reaction** at equilibrium at 800K



The production of $\text{H}_2\text{S}(\text{g})$ is favored by:

Indicate **True (T)** or **False (F)** for each of the following:

a) Increasing the temperature.

F

b) Decreasing the volume.

T

c) Removing S_2 .

F

d) Decreasing the pressure.

F

Do Not Write Below This

Exam II Score